

# Competition

This paper discusses the evolution of a market into a monopoly, duopoly or a competitive market and its contributing factors. It lays down the rules by which a market gets defined and presents the case for collusion and competition. The role of government intervention is reviewed in the light of the present analysis.

## Markets

Markets are assumed to be monopolistic or perfectly competitive based on certain criterion. It is understood that a monopoly has the incentive to change the price of a good for maximizing surplus. This is corrected by allowing competition whereby the true equilibrium is achieved, the intersection of the cost function and willingness to pay. The maxims of price and quantity competition for duopolies further state that the equilibriums are unique and well defined for both participants. This analysis establishes the relationship of marginal and total capital cost on competition.

The nature of a market and its composition is discussed by considering two situations: one of equal and the other of differing marginal costs.

### Equal marginal cost:

- i. *Firms collude to produce ( $P_m$ ,  $Q_m$ ,  $n$ )*
- ii. *The number of firms 'n' is an inverse function of capital cost.*

When firms produce goods of a similar nature and require the same inputs, the resultant equilibrium obtained resembles that of a monopoly. The firms have an incentive to sustain this equilibrium as it provides maximum surplus. Price competition causes a loss in revenue and the natural choice for the firms is to collude to preserve the monopolistic balance. Collusion does not require any direct partnership or signaling but an adherence to the firm's given allocation of quantity. This is in accordance with the Cournot concept of competition.

The number of firms is decided by the total capital cost or investment. This may range from one firm, a monopoly, to ' $n$ ' number of firms, a competition. If the total cost is high such that the break even quantity required is high, the number of firms is low.

The break even quantity ' $q$ ' for a fixed cost ' $F$ ', variable cost ' $c$ ' and market price ' $p$ ', is given by:

$$q = \sqrt{\frac{F}{p - c}}$$

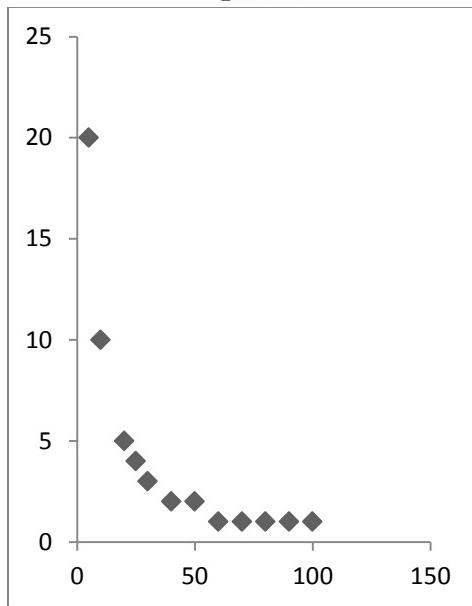
The ratio of the break even quantity to the market demand is related to the number of firms as shown in Table A.

*Table A.*

Break even ratio %	Number of firms
>50	1
$33 < x < 50$	2
$25 < x < 33$	3
$20 < x < 25$	4
$16 < x < 20$	5
$14 < x < 16$	6

The above table can be extended to a plot and is depicted in Figure A.

*Figure A.*



#### Variable marginal cost:

- i. *Firms set P such that the total market surplus is maximized for a given number of producers.*

For a more realistic understanding of markets, firms are assumed to produce similar goods with varying marginal costs of inputs. The equilibrium in such markets is competitively attained along the lines of a Bertrand interaction. This is an example of colluding to compete. Firms collude to set a price level that maximizes surplus equal to or below any high cost producer. The resultant equilibrium is  $(P_e, Q_e, n-t)$  where 't' is the number of producers with marginal costs above the set price level. However, if in spite of price competition, the highest cost producer is able to make margins, the equilibrium will be that of a monopoly with 'n' number of players.

## **State Intervention**

The state may intervene through quotas, taxation and subsidy to correct markets. A change in the costs of inputs is not reflected in price movements. Any gain in surplus caused by changes to cost of inputs being lowered accrues to the producer. In such cases the state may levy taxes to extract a part of these gains and redistribute it towards the consumer. This may however allow new producers as the margins rise and the break even quantity falls. Au contraire, if costs rise, producer surplus is affected. The state may then grant tax relaxations. Thus, taxation must follow the rate of change of costs. The state may also resort to measures such that markets are moved from a monopoly to a competition in cases of equal marginal costs or low variable marginal costs. This can be done by monitoring prices and quotas, it being a tedious task and against the principle of free trade. The state often enforces competition although the need for it is weak. It is an inherent ability of the participants that develops when the opportunity presents itself, and is always accompanied by collusion as depicted in the analysis. Competition is usually avoided by firms through the creation of heterogeneity – the splitting of a standard market into smaller segments by selling a similar good of utility but having different attributes.

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